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ENERGY, FUELS, AND RELATED EQUIPMENT

PETROLEUM MINISTRY COLLEGIUM REVIEWS 1977 WORK, OUTLINES 1978

Collegium of Petroleum Ministry Meets

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 p 3

[Editorial introduction: "From the Expanded Meeting of the Collegium of the Ministry of Petroleum Industry"]

[Text] A joint expanded meeting of the collegium of the Ministry of Petroleum Industry and the Presidium of the Central Committee of the trade union of workers of the petroleum and gas industry was held in Moscow on 26 January 1978.

Participating in the work of the meeting were Secretary of the CPSU Central Committee V. I. Dolgikh; chairman of USSR Gosplan N. K. Baybakov; I. P. Yastrebov, deputy chief of a CPSU Central Committee division; V. Yu. Filanovskiy, chief of a division of USSR Gosplan; V. T. Sedenko, chairman of the presidium of the central committee of the trade union of workers of the petroleum and gas industry; V. I. Fedorenko and Ye. L. Yegorychev, secretaries of the central committee of the trade union of workers of the petroleum and gas industry; deputy minister of construction of petroleum and gas industry enterprises K. K. Smirnov; deputy USSR minister of geology V. I. Igrevskiy; important workers from the CPSU Central Committee and the oblast and kray CPSU committees of the petroleum regions.

The managers of production and industrial associations, drilling and petroleum and gas extraction enterprises, petroleum pipeline administration, plants, and scientific research and planning institutes were invited to the meeting.

USSR minister of the petroleum industry N. A. Mal'tsev presented a report entitled: "Results of Work in the Sector for 1977 and Measures to Insure Fulfillment of the 1978 Plan in Light of the Tasks Posed in the Resolution of the December 1977 Plenum of the CPSU Central Committee and the Statement at It by Comrade L. I. Brezhnev, General Secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet" (the substance of the report was run in the April issue).

During the discussion statements were made by F. G. Arzhanov, chief of Glavtyumenneftegaz [Main Administration of the Tyumen' Petroleum and Gas Industry]; R. T. Bulgakov, general director of the Tatneft' [Tatar ASSR Petroleum] Association imeni V. D. Shashin; Ye. V. Stolyarov, general director of the Bashneft' [Bashkir ASSR Petroleum] Association; Sh. A. Dadashev, general director of the Turkmenneft' [Turkmen SSR Petroleum] Association; A. B. Suleymanov, general director of the Kasporneft' [Caspian Sea Petroleum] Association; I. G. Feklov, drilling foreman at the Kuybyshevneft' [Kuybyshev Petroleum] Association; R. S. Nurutdinov, drilling foreman of the Tatneft' Association imeni V. D. Shashin; V. T. Sedenko, chairman of the presidium of the central committee of the trade union of workers of the petroleum and gas industry; G. M. Levin, drilling foreman at the Nizhnevartovskneftegaz [Nizhnevartovsk Petroleum and Gas] Association; V. A. Sorokin, general director of the Grozneft' [Groznyy Petroleum] Association; V. I. Timonin, general director of the Mangyshlakneft' [Mangyshlak Petroleum] Association; L. M. Kuznetsov, chief of the Soyuzneftegazpererabotka [USSR Petroleum and Gas Refining] Science-Production Association. All of the speakers devoted primary attention to the questions of accomplishing the tasks set before the sector, disclosed shortcomings in the work of particular enterprises and organizations, and outlined ways for the petroleum industry to reach new frontiers. Socialist obligations for 1978 were adopted at the meeting.

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Tyumen' Administration Chief Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 pp 3-5

[Statement by F. G. Arzhanov, chief of Glavtyumenneftegaz]

[Text] The second year of the Tenth Five-Year Plan, the year of the 60th anniversary of Great October and the adoption of the new USSR Constitution, has ended. The December 1977 Plenum of the CPSU Central Committee and the 8th session of the USSR Supreme Soviet discussed and adopted the State Plan of Economic and Social Development of the USSR and USSR State Budget for 1978. The decisions of the December Plenum of the CPSU Central Committee and 8th session of the USSR Supreme Soviet were received with great satisfaction by the workers, employees, and engineering-technical personnel of Glavtyumenneftegaz. Inspired by the praise of work on developing petroleum and gas deposits expressed in the speech of Comrade L. I. Brezhnev, General Secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet, the collectives of our enterprises, brigades, and sections are adopting stepped-up socialist obligations. The collective of the Nizhnevartovskneftegaz Association was the initiator of socialist competition and the drilling brigades of foremen V. T. Gromov and Hero of Socialist Labor G. M. Levin have adopted the obligation of raising drilling output per brigade to 80,000 meters a year.

In 1977 the petroleum deposits of Tyumenskaya Oblast produced 211.2 million tons of petroleum with gas condensate; this included 5 million

tons beyond the plan. The drilling workers of the main administration drilled 3.8 million meters and turned over 1,469 wells, 33 more than the plan assignment. We put 1,485 wells into operation, 132 beyond the plan.

At the same time, there were serious shortcomings in our work in 1977. For the first time, the assignment for increasing reserves and the volume of exploratory drilling was not fulfilled. Steps have now been worked out to insure that the five-year plan for their growth will be achieved.

The plan for commercial rate of drilling was not fulfilled because of an increase in the number of unsealed operations shafts and a 2.2-fold rise in time lost through accidents and defective work compared to 1976. The plan for switching wells to mechanized petroleum extraction was not fulfilled. Of the 4,542 projects under construction only 3,135 were put into use. The plan for introduction of fixed capital was only 86 percent fulfilled. The plan for construction and installation work in non-production construction was not fulfilled, although the construction organizations proper fulfilled their plan by 105 percent.

In 1978 Glavtyumenneftegaz has a planned extraction assignment of 243.7 million tons of petroleum and gas condensate and an additional assignment of 2 million tons. The plan for drilling operating wells is set at 5 million meters.

To meet these indexes will be a difficult job. Calculations made for the specific pools show that, with the planned volume of drilling, the new wells will produce 24.1 million tons of petroleum and gas condensate in 1978, leaving 221.6 million tons to be produced by the old wells. The old wells will be able to provide this amount only if the decrease in extraction for transitional wells is not more than 1.5 percent (in 1977 it was 2.5 percent). For this reason, Glavtyumenneftegaz and the associations have developed a set of measures to stabilize the extraction of petroleum and gas condensate at the old wells, and step up the launching of new wells.

Drilling workers face a complex challenge. They are expected to drill 1.3 million meters more in 1978 than in the past. The maximum growth in drilling volume achieved in past years was just 400,000 meters. Drilling brigades of other associations account for 700,000 meters of the total volume of drilling. However, when we talk about contract drilling, we understand that an enormous share of the work continues to fall to Glavtyumenneftegaz, because in the full cycle of well construction there are 10 members of other occupations for each member of the drilling brigade. We understand the criticism of our work with contracting drilling brigades correctly and have taken all the necessary steps to significantly improve this work. At the same time we call on the Ministry of Petroleum Industry to help us solve the problem of moving these brigades by air and we call on the Tatneft', Bashneft', Kuybyshevneft', and Saratovneftegaz associations to perform the obligations assigned to them.

In order to carry out the upcoming drilling program in 1978, organizational-technical measures have also been developed that insure that the tasks given to Glavtyumenneftegaz will be accomplished.

In 1978 we are expected to incorporate 1,714,000,000 rubles of capital investment, including 762 rubles for construction and installation work. Plans call for the construction of 6,090 objects and the launching of 4,210 of them in 1978. Measures have been worked out to make better use of capital investment and shorten construction periods and ways to realize them have been outlined.

Glavtyumenneftegaz has also reviewed the tasks involved in fulfilling directive assignments for extraction of petroleum until the end of the Tenth Five-Year Plan. To meet the planned volumes of petroleum extraction in Western Siberia in 1978 and 1979 we must resolve the problems of developing new deposits: building them, construction of bases and housing, and material-technical supply for the entire program until 1980.

In all, 22 deposits must be brought into operation in 1976-1980; 10 of them were introduced in 1976 and 1977.

During 1978 we plan to launch eight more deposits. Thus, by the end of this year we expect to be operating 18 new deposits, four of which will have roads and just seven of them with direct electrical energy.

To reach the planned volume of petroleum extraction at the new deposits it will be necessary to drill 3.8 million meters of wells in 1979 and 6 million in 1980. It is obvious that we will have to bring roads and power transmission lines to the deposits in order to meet this challenge.

For this reason, during 1978-1980 we must build at least 820 kilometers of hard-surface roads and 1,170 kilometers of double-circuit power transmission lines with voltages of 110-220 kilovolts.

Housing construction is very important to meet the challenges facing Glavtyumenneftegaz. In 1978-1980 we are expected to build 1,427,000 square meters of housing. Just to meet growth in number of employees during this period we will need 2,166,000 square meters, however, and taking into account the existing shortage the total need is 3,596,000 square meters. The situation is aggravated by the fact that the gap between need and availability is not diminishing, but rather is growing because of the systematic failure to fulfill plans for housing construction. To solve the housing problem the Ministry of Petroleum Industry must take steps to sharply increase the capacities of the organizations engaged in building housing in Western Siberia so that a minimum of 2 million square meters of housing can be built for the petroleum workers of Glavtyumenneftegaz in the time remaining until the end of the five-year plan. Moreover, we ask that Glavtyumenneftegaz be assigned to build log housing in watch and worker communities with its own employees in the amount of 120,000 square meters in 1978, 150,000 square meters in 1979, and 150,000 square meters in 1980.

To perform the planned amount of drilling Glavtyumenneftegaz will need to receive 445 drilling rigs and the corresponding amount of other equipment necessary for well building in 1978-1980. However, the situation with delivery of drilling rigs did not improve in 1977 even though this question was reviewed several times. Glavtyumenneftegaz, receiving drilling machines allocated for 1976 only in the first quarter of 1977, was not able to get them to new deposits by water and install them in time, which significantly retarded the increase in drilling capacities at new deposits.

By the end of 1980 the number of operating wells should more than double that of 1977, and the number of mechanized wells should be 3.5 times greater. Therefore, there is a sharply increasing need for equipment and materials, particularly for drilling, mechanized petroleum extraction, and current and capital well repair. The volumes of delivery of many types of equipment and materials should be several times greater in 1980.

In connection with the large volume of preparatory work to fulfill 1979 assignments and to begin work on their fulfillment in 1978, it is essential for the Ministry of Petroleum Industry to give one-time assistance in providing transportation and road-building machinery in 1978.

The great remoteness of the new deposits from existing cities and communities, the lag in construction of the roads to these deposits, and the significant volumes of drilling work make the construction of nearby bases for drilling enterprises paramount. The prefabricated buildings known as RRM's and ARI's have worked out well and already become traditional for these purposes. However, the need for them is not being fully met.

To accomplish the priority tasks in building up petroleum deposits and housing, municipal, and cultural-domestic installations capital investment for 1979-1980 must be increased an additional 524 million rubles, which includes 476 million rubles for construction and installation jobs with an increase in the volume of contract work for the construction ministries.

The question of personnel becomes particularly important with the growing volume of drilling. The experience of the last two years testifies that it is becoming difficult to staff enterprises with skilled workers. This applies particularly to drilling, tower construction, well repair, special machinery, and motor vehicle transportation enterprises. Glavtyumenneftegaz sees the solution to this problem in training skilled workers at state vocational-technical schools for work at Glavtyumenneftegaz enterprises, sending a large number of young specialists in drilling and mechanical, power, and heat engineering to work, and assigning servicemen being discharged from the USSR Armed Forces into the reserve to us on Komsomol passes.

Considering the complexity of the problem of developing new deposits in 1979-1980 and the need to resolve this problem at a definite time

in order to accomplish the assigned tasks, Glavtyumenneftegaz considers it essential to review the question of additional steps to insure the extraction of 315 million tons of petroleum and gas condensate in Western Siberia in 1980.

The petroleum workers of Glavtyumenneftegaz understand their full responsibility for performance of the missions that have been given to them and will apply all their efforts, knowledge, and experience to successfully accomplishing them.

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Tatar ASSR Petroleum Association Director Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 pp 5-6

[Statement by R. T. Bulgakov, general director of the Tatneft' Association imeni V. D. Shashin]

[Text] The collective of the Tatneft' Production Association imeni V. D. Shashin successfully accomplished the tasks given to it for 1977. It fulfilled and overfulfilled the state plan for petroleum extraction, utilization of petroleum gas, and construction of petroleum wells. We fulfilled our 1977 socialist obligations and the obligations adopted in honor of the 60th anniversary of Great October. We extracted 253,500 tons of petroleum beyond the plan and 54 leading brigades completed their assignments for the first two years of the Tenth Five-Year Plan ahead of schedule, by 7 November. The collectives of the Al'met'yevneft', Aznakayevskneft', Prikamneft', Suleyevneft', and Aktyubanneft' petroleum and gas extraction administrations and the Al'met'yevsk and Aznakayevo drilling administrations made significant contributions to performance of these obligations.

The socialist competition among petroleum workers in the Tatar ASSR was accompanied by an increase in the creative initiative of production innovators and birth of new initiatives. The initiative of drilling foreman D. Nurutdinov under the slogan "Flow Construction Methods for Petroleum Wells" reduced the well construction cycle to 30.6 days.

The December 1977 Plenum of the CPSU Central Committee and 8th session of the USSR Supreme Soviet set new tasks before the Soviet people in economic and social development of the country in 1978. The petroleum workers of the Tatar ASSR must extract 95.2 million tons of petroleum and gas condensate and deliver it to the country's national economy.

Successful accomplishment of these tasks requires, in addition to the efforts of the Tatar petroleum workers, effective help from the Ministry of Petroleum Industry, related ministries and departments, and scientific research and planning institutes. It is essential to find answers quickly to such important problems as raising the petroleum output of pools, including flooded ones; comprehensive study of petroleum presence in Carboniferous beds and their rational development; and bringing the difficult-to-extract reserves of small deposits into industrial use.

Material-technical supply plays a large part in accomplishing the tasks that have been given to the Tatneft' Association.

At the same time, we are experiencing shortages of certain types of equipment. For example, to rig up the pools of the upper horizons of the Romashkinskoye deposits in conformity with standard industrial diagrams we must receive and install five PTB-10 furnaces, but they have not yet been allocated. We are not receiving adequate numbers of drilling machines, pressure fittings for hydrogen sulfide petroleum, and other equipment.

The reliability of the power system is an important problem in electricity supply to the petroleum regions. The lag in construction of power installation has caused significant overflows on existing substations and high-voltage lines. The Aznakayevo, Abdrakhmanovo, Aktash, Chishma, and Bukhar base substations are especially overloaded which leads to irreplaceable losses of petroleum not only in unfavorable weather conditions but even under ordinary conditions. The USSR Ministry of Power and Electrification is not carrying on the essential amount of work to build high-voltage (110 and 220 kilovolts) lines and the construction volumes established by plan are violated year after year.

It is now urgent to carry out scientific research and planning-design work to develop special equipment for the extraction of high-sulfur petroleum, transfer of hydrogen sulfide-containing water, and selection of material to manufacture this equipment.

Work on technical refinements of production continued in 1977. More than 100 block-type automated installations for petroleum extraction and maintaining pool pressure, as well as nine centers for commercial petroleum records and four fully automated regional engineering-technical services, have been put into operation. In all, 90 percent of the total petroleum and gas condensate extraction at the Tatneft' Association is based on fully automated regional engineering-technical services. In the anniversary year the ASU [automated control system] for industrial processes at the Yelkhovneft' Petroleum-Gas Extraction Administration was launched; it solved 12 sets of problems covering various aspects of the production and economic activities of the enterprises. The Tatneft' Association now has eight functioning automated control systems for petroleum extraction enterprises.

Plans for 1978 envision launching an organizational-technological ASU for the Irkenneft' Petroleum-Gas Extraction Administration and an ASU for the Suleyevneft' Administration and fully automating five regional engineering-technical services for petroleum extraction and maintenance of pool pressure.

Work with the new administrative structure has permitted us to identify the positive and negative features of the reorganization of production. The petroleum capacities built in the Tatar ASSR, the large number of

installations and subdivisions, and the enormous amount of work required to organize petroleum production to fulfill the stepped-up plans for petroleum extraction demand a more attentive attitude to management structure.

In recent years petrochemical production has begun to develop rapidly in the petroleum extraction region in the southeastern Tatar ASSR, the capacity of the Kama Truck Plant has increased, and the cities of chemical workers and motor vehicle builders have grown accordingly.

We are happy that the new, well-organized cities of Nizhnekamsk and Naberezhnyye Chelny are being built in our republic. Housing construction is going forward at an intensified pace in them and cultural-domestic conditions are improving. Compared to these cities, the cities and worker communities of the petroleum workers are beginning to look very poor and this lag will increase in the future. Analysis shows that if the current level of construction is maintained the waiting list for housing will increase each year and by 1980 will reach 20,000 persons. We are seriously concerned by the question of keeping personnel; this problem can be solved by taking steps to increase housing construction in 1979.

Despite existing difficulties the collective of the Tatneft' Association will do everything possible to complete 1978 in a worthy manner.

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Bashkir ASSR Petroleum Association Director Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 pp 6-7

[Statement by Ye. V. Stolyarov, general director of the Bashneft' Association]

[Text] In preparation to celebrate the 60th anniversary of Great October and the adoption of the new constitution in a worthy manner, the petroleum workers of the Bashkir ASSR adopted stepped-up socialist obligations for above-plan extraction of petroleum and gas, drilling petroleum wells, capital construction, and other types of association activity. As it did also in 1976, the collective of the association fulfilled all its 1977 obligations. We surpassed the plan by 125,000 tons of petroleum extraction and 4 million rubles worth of output sold. Our above-plan profit was more than 3 million rubles. The drilling enterprises fulfilled their plan by 3 December 1977 and surpassed the plan by more than 58,000 meters. The plan for increasing petroleum reserves and for other technical-economic indexes was met.

The collectives of the Krasnokholmskneft', Arlanneft', Chekmagushneft', and Tuymazaneft' petroleum-gas extraction administrations, the Krasnokholmskiy, Tuymazy, and Neftekamsk drilling administrations, the Tyumazy geological prospecting office, and the Administration of Industrial Transportation worked especially well in this anniversary year.

Outstanding records were made by the brigades led by drilling foremen Kh. A. Sultanov and T. M. Vil'danov, both heroes of Socialist Labor; winners of the 1977 State Prize Hero of Socialist Labor K. G. Ikhin, leader of a brigade of tower installers, A. G. Basirov, ongoing repair foreman, I. T. Grishkov, drilling foreman, R. T. Kasimov, petroleum extraction foreman, and P. Ya. Kutlin, leader of a comprehensive well construction brigade, as well as many others.

The collective of the association consistently fulfilled plan assignments, insuring a high level of annual petroleum extraction with significant output from the primary deposits and flooding of the output being extracted. This has proved possible owing to active exploration, concentrating efforts in the most promising region; accelerated construction and introduction of deposits that are discovered; efficient use of operations drilling by concentrating major drilling capacities in new regions; active work to improve the extraction system aimed at forced recovery of liquid taken off from deposits with diminishing extraction levels.

We believe it will be necessary to carry on exploratory drilling of at least 300,000 meters a year for many years in the Bashkir ASSR and are ready to use this volume of work efficiently. Association geologists, with active help from the geological service of the Ministry of Petroleum Industry, have worked out methods of petroleum exploration for the conditions of the Bashkir ASSR. Experience shows that they are realistic. Energetic work by the geological prospecting offices and Bashneftegofizika [Bashkir ASSR Petroleum Geophysics] trust made it possible to prepare the necessary number of structures for the required volume of deep exploratory drilling. Practice shows that the extent of deep exploratory study of the territory of the Bashkir ASSR is clearly inadequate.

Work is underway to improve the organization of drilling. New deposits are drilled in large clusters consisting of 16-20 wells, which makes the work of the tower installation brigades much easier and reduces the time required to install drilling wells and build them up. All this has made it possible to give significant help to our comrades in Tyumen'.

Nonetheless, the association is experiencing difficulties in material-technical supply, construction, and transportation. Despite multifaceted help the contracting organizations of the construction ministries did not fulfill the plan of construction-installation work in 1977 and as a result, for example, the Aksakovneft' Petroleum-Gas Extraction Administration did not fulfill its petroleum extraction plan.

The association failed to fulfill its plan for housing construction for the second straight year. Unfortunately, the primary contractor, the Ministry of Construction of Petroleum and Gas Industry Enterprises does not fulfill its plan. Because enterprises of this ministry are

being enlisted to build projects on a large scale in Western Siberia, each year it has become more difficult for them to fulfill work volumes in what are called the "old regions." Under such conditions the principal task of the association is to develop its own construction organization.

The petroleum workers of the Bashkir ASSR will continue as before to make every effort to fulfill their plan assignments and socialist obligations for 1978.

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Turkmen SSR Petroleum Association Director Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 pp 7-8

[Statement by Sh. A. Dadashev, general director of the Turkmenneft' Association]

[Text] Because the primary pools of the deposits being worked by the association have entered the third stage of exploitation, which is characterized by a sharp drop in petroleum extraction, steps were taken in 1977 to reduce the rate of drop in extraction.

Operational petroleum drilling, for which the association overfulfilled its 1977 plan, was concentrated in the most productive zones. Eighty-six new petroleum wells were put into operation. We overfulfilled the plans for switching wells to mechanized methods of exploitation. Work was done to heat the gas for gas-lift systems and to equip wells with starting valves. The proportion of gas-lift extraction in the total annual volume was almost 40 percent. A great deal of engineering geological and installation repair work has been done.

However, despite the steps taken, neither the plan nor the assignment established later for the period June-December for extraction of petroleum with gas condensate was fulfilled. The decrease in petroleum extraction was caused by the cessation of well gushing, intensive flooding of wells, and a decrease in initial output when wells were switched to mechanized procedures.

Another reason for failure to fulfill the plan is the unreliable work of the gas-lift system when even a slight cooling occurs, which is linked to imperfections in the gas preparation assemblies and the lack of drying units and pumps for measured feeding of the hydrate formation inhibitor.

Flaws in the organization of work by current and capital well repair brigades and the large number of idle wells and wells waiting for development and repair had a negative effect on volume of petroleum extraction.

Gas extraction in 1977 rose in comparison with 1976 as a result of the introduction of new gas horizons into operation and the launching of

the second shop of the main compressor station of the SATs-III gas pipeline in Kotur-Tep. The utilization of petroleum gas reached 64.8 percent. However, the plan for extraction and sale of gas was not fulfilled because of refusals by the Ministry of Gas Industry to accept the gas owing to frequent limitations on the SATs-III pipeline and the unsatisfactory work of the compressor stations.

Geological exploration work was carried on at 30 sites in 1977. Three new structures were included in deep exploration and one petroleum deposit, two gas deposits, and four petroleum pools were discovered. Construction was completed on 26 exploratory wells, 11 of which proved productive.

The plan to increase reserves of natural gas was overfulfilled, but the plan for increase in petroleum reserves was not fulfilled because of the negative results of geological exploration at two sites, the insignificant reserves of the Lower Red bed, slowness in moving to new sites, growth in gas reserves instead of the expected petroleum, and the lag in exploratory drilling.

Some positive results have been achieved in capital construction with respect to both incorporation of capital and introduction of objects and fixed capital. However, organizations of the Turkmen SSR Ministry of Construction did not fulfill the plan for housing construction.

Concrete steps have been outlined for 1978 to insure performance of assignments for well drilling and petroleum and gas extraction: begin development of the Gogran'-Dag and Kamyshldzh deposits; launch new petroleum and gas wells into operation; increase the volume of water pumped out to maintain pool pressure; reduce the number of idle wells and their period of construction; launch objects for building up deposits, introduce 23,000 square meters of housing, and other cultural-domestic facilities. We also plan to increase the volume of geological exploration and improve the quality of current and capital well repair.

The collective of the association has adopted socialist obligations to extract 50,000 tons of petroleum and gas condensate beyond the plan and surpass the plan for other technical-economic indexes.

However, the following problems remain unsolved. Better gas preparation equipment is essential to improve the reliability of gas-lift exploitation. In addition, reliable gas compressors that make it possible to create the necessary pressure are required when switching to compressor gas-lift.

In view of the increased number of mechanized wells and greater volume of repair work the number of A-50 and PPU-3 aggregates and UKP-80 mobile compressors and allocations for deep pumps and hoses must be increased.

The association considers it essential in determining the most efficient system for working the Lower Red pool to involve main sectorial

institutes, above all the All-Union scientific research institute, to help the territorial scientific research and planning institutes.

For several years now we have been short of fittings, shaft heads, anti-blowout equipment, and high-strength casing for drilling exploratory and operational gas wells at sites with anomalously high formational pressures.

By carrying out the planned activities and solving the problems that have been posed the association will unquestionably fulfill its 1978 assignments and the socialist obligations it has assumed.

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Caspian Sea Petroleum Association Director Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 pp 8-9

[Statement by A. B. Suleymanov, general director of the Kaspomor-neft' Association]

[Text] The enterprises and organizations of the Kaspomor-neft' Association made definite progress in 1977 in developing and exploiting offshore deposits of petroleum and gas. The plans for construction and installation work in gas extraction and sale of output were fulfilled ahead of schedule, on 16 December and 28 December respectively. The plan for gas extraction was surpassed by 484 million cubic meters and the plan for sale of output by 2.0 million rubles. Two new pools were discovered and three sites introduced for deep exploration as the result of geological prospecting work.

However, despite these positive results, the association did not fulfill its plan for petroleum extraction and drilling. The primary causes of failure to fulfill the plan for petroleum extraction were a drop in the level of extraction at the deposits which are in the late stage of exploitation and the impossibility of making up this decrease by introducing new deposits because construction work on the new deposits is lagging behind owing to lack of equipment.

Carrying out a set of organizational-technical measures is improving the state of petroleum extraction somewhat. Despite a slight improvement in the technical-economic indexes for drilling compared to 1976, the association's drilling organizations did not meet their assigned challenges in 1977.

Offshore drilling work typically involves great well depth and a year-by-year increase in the complexity of geological and technical conditions of this work; the inadequate volume of appropriate machinery and technology makes it impossible to drill such wells properly at a high rate.

For 1978 the association has worked out a set of activities in each work area and determined methods and times for carrying them out, but it must be remembered that increasing petroleum extraction in the

Caspian Sea depends entirely on going into deep-water sectors where promising new structures have been identified, which means developing well-drilling at depths of 5,500-6,000 meters, and on solving the complex technical problem of building clustered offshore platforms at great sea depths.

In the 1978 plan more than 70 percent (23 out of 31) of the exploratory wells where drilling is beginning have drilling depths of greater than 5,000 meters. We do not have adequate technical means to drill such wells, which greatly extend the time required for such work.

The situation is no better with equipment for extracting petroleum and gas. By decision of the Ministry of Petroleum Industry and the USSR State Committee for Supervision of Industrial Safety and Mining Inspection, gas condensate wells with anomalously high pressure must be equipped with cut-off valves. Only 10 sets, received in 1976, have been installed. The association's requirement for this equipment must be satisfied.

Despite great problems, the collective of offshore petroleum workers will make maximum efforts to fulfill the obligations established by plan and adopted in socialist competition for 1978 for all technical-economic indexes.

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Kuybyshev Drilling Foreman Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 p. 9

[Statement by I. G. Feklov, drilling foreman of the Kuybyshevneft' Association]

[Text] Last year was a year of new creative searching for us, as it was for all worker collectives in the country.

Our brigade deserves some of the credit for the fact that the Otradnyy Drilling Administration drilled more than 6,000 meters of rock beyond the plan in 1977 and overfulfilled its assignments for exploratory and operational drilling. During the year brigade members submitted seven efficiency proposals that were introduced into production. As in previous years, the brigade worked without accidents or violations of production discipline.

For many years now our successes in work have been facilitated by socialist competition with the best drilling collectives of the Ministry of Petroleum Industry: M. G. Drozdev's brigade from our administration; the N. I. Mochal'nikov brigade of the Neftegorsk Drilling Administration; and Ye. K. Murzin's brigade of the Buzuluk Drilling Administration. There can be no permanent forms of socialist competition, so together with public organizations of the administration we are endeavoring to improve them and employ everything new, progressive, and more effective.

Five years ago we were the first in the sector to set up a council of drilling foremen in the administration. This public body sought out and introduced in practice new forms of organizing socialist competition and exchange of progressive know-how and helped the slower collectives. In 1977 it was proposed at the council that collective sponsorship of slow brigades by leading brigades be organized. This kind of sponsorship, for the brigade of new foreman N. A. Chaplygin by drilling foreman M.G. Drozdev's brigade and for A. N. Ignatov's brigade by our brigade, was formulated in joint contracts.

As a result of this collective sponsorship the sponsored brigades finished 1977 with good results. They fulfilled standard assignments, saved stated capital, and, most importantly, they developed confidence in their own strength. They are full of determination to work even better in 1978.

Unfortunately, we have not yet eliminated all the factors that disrupt work schedules. These are shutdowns of 10-12 days waiting for casing pipe and the lack of bentonite powder and barite. These things also prevent rhythmic work by other brigades of the administration and association.

We are ready to switch completely to working with clay powders if we can be given a continuous supply of them and casing pipe. In addition, our brigades continue to need cultural recreation booths and watch buses.

Responding to the initiative of the Moscow workers to celebrate the first year of the adoption of the new USSR Constitution with outstanding indexes and in answer to the Letter of the CPSU Central Committee, USSR Council of Ministers, AUCCTU, and Komsomol Central Committee concerning further development of socialist competition, our collective has assumed the obligation of fulfilling 3.5 annual plans of the Tenth Five-Year Plan by the first anniversary of adoption of the USSR Constitution and completing the entire five-year plan in less than four years.

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Al'met'yevsk Drilling Foreman Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 pp 9-10

[Statement by D. M. Nurutdinov, drilling foreman of the Al'met'yevsk Drilling Administration of the Tatneft' Association imeni V. D. Shashin]

[Text] Our administration must shorten construction times for operating wells by 13 days during this five-year plan. This is a very difficult assignment. The collective of the administration took a highly responsible approach to solving this problem. Today work is going forward to insure continuity of the well construction process and reduce work periods in all of its stages.

A number of organizational-technical measures have been worked out at the administration and implemented at the sites to increase the rate of drilling and the quality of construction. We have introduced bits of the AV, AN, ISM, and SV series, screw-type face engines, and combined drilling columns which has made it possible to increase the drilling per bit by 15 percent in the last two years. The introduction of more effective methods of combating complications has made it possible to cut expenditures of time and means to combat them by 14 percent.

A great deal has been done to shorten the time required to open up wells. Specifically, two-phase foams are used extensively to speed up the initiation of flow. The use of new machinery and progressive technology and widespread socialist competition have enabled us in the last two years to increase the commercial rate of drilling by 4.6 percent and reduce the time required to open up a well by 45 percent.

The most outstanding achievement of the Al'met'yevsk drilling workers was fulfilling the five-year plan assignment for reducing length of well construction in just two years. The 1980 assignment was to build a well in 41 days, but already in 1977 the average time required per well for 364 wells was 40.9 days for the administration and 30.6 days for our brigade. In early January 1977 the brigade came forward as the initiator of competition to reduce well construction times under the slogan "Flow Construction Methods for Petroleum Wells." There are 42 brigades, teams, and sections from the drilling administration taking part in the competition. In the association our initiative has been supported by 54 drilling brigades. Among them the best results have been received by the brigades headed by M. P. Grin', V. M. Ryabashev, Ye. I. Onishko, and N. G. Dratskiy.

We will continue to search for ways to improve machinery, technology, and the organization of production further. However, even full use of reserves will not guarantee the required rate of acceleration in well building. We must improve the supply of special means of transportation, truck cranes, buses, plugging equipment, and the like. This will make it possible for our fellow workers to supply drilling brigades with tools and materials on time and participate effectively in the competition to shorten the cycle of well construction.

Our drilling administration is working to increase the production per bit. Highly productive bits and turbodrills are being introduced. However, the BrN-type pumps do not entirely meet current requirements and spare parts for them, especially hydraulic boxes, are not supplied in adequate volume (20 percent of our needs). We must install new, more powerful pumps on our drilling rigs more quickly.

We are not pleased at all by the organization of watch conveyance by passenger motor vehicle transportation. This question demands urgent study and solution.

The drilling workers of the Tatar ASSR, approving and supporting the decisions of the December 1977 Plenum of the CPSU Central Committee and responding to the party's appeal to the Soviet people, will apply all their efforts, knowledge, and accumulated experience to fulfill the state plan and their socialist obligations for 1978.

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Director of All-Union Research Institute Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 pp 10-11

[Statement by G. G. Vakhitov, director of VNII (All-Union Scientific Research Institute of Petroleum and Gas)]

[Text] Like most of the enterprises in our sector, in 1977 VNII completely fulfilled its subject plan, socialist obligations, and additional assignments.

Our most important completed projects were: the technical-economic substantiation of applying methods to increase petroleum output at deposits in the country during 1978-1980; a draft of development of the Uzen' deposit, a long-term plan for introduction of technological petroleum and gas extraction processes using foams in 1978-1980.

In 1977 the institute received 30 author's certificates for inventions, published 20 methods manuals and sectorial standards, and carried out testing of developmental projects. Specifically, the departmental commission accepted the design of the AP6M drill for opening up layers at depths down to 6,000 meters and temperatures up to 180 degrees C. The drill was awarded the No 1 quality category. The Kalush Nefteburmashremont Plant is supposed to begin producing these drills in 1978.

We are doing a great deal at VNII to improve the quality of plans. Work has been completed on writing a set of regulations for planning the development of petroleum deposits. It has been approved by the ministry and sent out to the sites. The implementation of this guideline document on a sectorial scale will make it possible not only to accelerate and standardize site planning but also to take a scientifically sound approach to questions of long-range planning.

A great deal of work is being done to refine the system of working petroleum deposits located in different geological conditions and to improve site planning techniques.

The main reserve for raising the effectiveness of scientific work is rapid and fuller introduction of research results in industry. This is the bottleneck in our work. We see major reserves for raising the efficiency and quality of scientific research in the technical re-equipping of science, switching the research process to the techniques of the automatic experiment, analysis, and storage of results.

The institute is changing over to the shop-program principle of resolving major construction programs. In 1977 VNII was given two new and very important problems. The first was to maintain the records and analyze the state of petroleum reserves in the country for the three categories that determine petroleum extraction. The objective of this project is rational coordination of rates of removal with the state of reserves. The second problem is to study the reliability of petroleum field equipment, compare the quality of Soviet equipment with the best foreign models, analyze reasons for the ineffectiveness of certain Soviet machinery, and search for ways to improve it. We have already obtained the first results in these new fields of study.

The level of petroleum extraction in our country has been set by the national economic development plan for 1978. As the primary method of fulfilling the plan we chose the path of intensified extraction, increasing the rate of removal of existing reserves. It can be demonstrated that the optimal rates of removal of reserves are not always realized in practice at new deposits.

To resolve the second problem the institute in 1977 carried out an analysis of the reliability of petroleum equipment based on figures for 1976. Some results of this analysis were reported in June 1977 at the session of the collegium of the Ministry of Petroleum Industry.

It was shown that overall for all types of equipment used in mechanized well exploitation the period between repairs was inadequate, which increases the volume of repair work (in 1976 250,000 current repair jobs were carried on wells in the sector) and well downtime, reduces their productivity, and disrupts the production schedule. Questions of raising the quality of equipment are not simple. They cannot be solved all at once because the final result, quality, does not manifest itself in some one element; rather it builds up gradually and consistently throughout the entire chain from design and materials through manufacture to transportation and even storage of the finished equipment. Perhaps the time has come to think of preparing a special decision on these issues.

In our view, the main conditions for raising the effectiveness of sectorial science are improving the structure of this science by expanding planning-design and experimental industrial projects, streamlining the exploitation of petroleum deposits and long-range planning on the basis of proven reserves, generalizing experience with exploitation under different geological and physical conditions, and on this basis improving methods of site planning and the quality of industrial equipment.

For its part, VNII as a scientific organization which pays close attention to production problems will do everything it can to insure fulfillment of the 1978 national economic plan and the five-year plan as a whole.

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Trade Union Chairman Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 pp 11-12

[Statement by V. T. Sedenko, chairman of the central committee of the trade union of workers of the petroleum and gas industry]

[Text] An important challenge has been set before us, the economic and trade union leaders: reinforce the great labor and political enthusiasm evoked by the competition in honor of the 60th anniversary of October and adoption of the new USSR Constitution on the basis of thorough analysis of positive work know-how last year, making maximum use of internal reserves; concentrate primary attention on practical solutions to the problems of raising the efficiency of production and quality of work; insure a precise work rhythm from the first days of the year and see that all labor collectives and workers fulfill their state plan assignments and socialist obligations; make 1978 a year of shock labor.

If we approach evaluation of the work done from this standpoint, as a whole the working people of the sector labored very hard last year. However, by no means everything possible was done to achieve the best results. This is confirmed by the fact that certain production associations did not fulfill the plan assignments ratified for them or even the lower ones allowed later. Moreover, we still have a high proportion of brigades that do not fulfill their assignments for drilling, underground and capital well repair, and tower construction. Not all labor collectives accomplished their assignments for raising labor productivity. A great deal of working time is lost and raw and processed materials and tools are used unproductively. All this is evidence that the great political and labor enthusiasm in the local areas has not always been backed up by the required organizational and technical measures to create conditions for highly productive labor.

In connection with this it would be wise to set up a sectorial headquarters of socialist competition which could analyze the state of competition, make timely remarks and support innovations appearing during competition in the local areas, and take operational steps to disseminate the best progressive know-how and render the necessary help to lagging collectives. Using the working experience of the best collectives we must organize more schools to study their results.

Inadequate attention to solving social questions is definitely one of the factors that has prevented the sector from achieving high indexes. Working people of the sector received about 370,000 square meters of housing less than scheduled last year and the plan for construction of children's preschool institutions was only 71 percent fulfilled, while the plan for construction of general educational schools was 70 percent fulfilled, hospitals — 44 percent, and polyclinics — 75 percent. And all this took place under conditions where an acute need for housing and social and cultural-domestic

installations is felt in virtually every petroleum region. This particularly applies to the Northern region.

It seems to me that the Ministry of Petroleum Industry and central committee of the trade union should take a more high-principled approach to evaluating the work of labor collectives and their economic and trade union leaders with due consideration for resolving the social issues envisioned by the state plan and included in collective contracts.

A characteristic feature of our sector is working under field conditions, often in difficult natural and climatic conditions and away from one's family. This demands that we all give greater attention to solving the problems of creating good housing and cultural-domestic conditions.

Useful know-how in working out and fulfilling plans for social development of collectives has been accumulated at many enterprises and associations of the sector. At the same time, the sector as a whole does not have such a plan even though the trade union central committee together with the Ministry of Gas Industry and the Ministry of Construction of Petroleum and Gas Industry Enterprises have developed and are implementing sectorial plans of social development.

Another serious matter that must be given attention is protection of labor. The trade union central committee believes that the trade union committees and technical labor inspectorate should strengthen checks on labor protection, step up public work in this area, and combat violations of the requirements of labor protection and labor and production discipline.

The challenges set before the working people of the petroleum industry in 1978 are great and important. However, the sector has everything necessary to fulfill these tasks. As the December 1977 Plenum of the CPSU Central Committee stressed, what is needed is a high level of organization, order and discipline in all work sectors; we must labor like shock workers, broaden socialist competition even further, make rational, thrifty use of all that we have, and accelerate scientific-technical progress and the growth of labor productivity by every means. The Ministry of Petroleum Industry has worked out a program of measures to accomplish these tasks.

Socialist obligations for 1978 have been adopted at all enterprises and organizations of the sector, and in the brigades and shops. The leading collectives are coming forward as initiators of socialist competition within the sector to fulfill 1978 assignments ahead of schedule.

All of this gives us confidence that the working people of the petroleum industry will perform the tasks set before the sector with honor and make a worthy contribution to realizing the historic decisions of the 25th CPSU Congress.

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Nizhnevartovsk Drilling Foreman Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 p 12

[Statement by G. M. Levin, drilling foreman of the Nizhnevartovskneftegaz Association]

[Text] The collective of our drilling brigade fulfilled its plan for the first two years of the five-year plan and its socialist obligations in honor of the 60th anniversary of Great October ahead of schedule. We drilled more than 77,000 meters of oil wells in 1977, more than 21,000 meters beyond the plan, completed construction on 37 wells, and had a productive time index of 97 percent.

The brigade has established a tradition of raising labor productivity and stepping up the rate of drilling work year after year.

The collective of the brigade formed more than 15 years ago and we have already been working in Tyumenskaya Oblast for 10 years. In this time we have drilled 337 wells which have produced more than 80 million tons of petroleum and gas condensate. We are constantly raising our technical level. All members of the brigade are students, some in economics school, others at tekhnikums or schools for working youth. We have set up a party group.

We attach great importance to the organization of socialist competition in the brigade and in our drilling administration No 1. In the administration alone there are nine forms of socialist competition in operation, including the awarding of ratings to drilling workers and assistance, which is being done for the first time. A few years ago our brigade was the initiator in setting up a school of progressive know-how.

The composition of the brigade changes as time passes, of course, and young people arrive. This makes tutoring very important.

Each year there are fewer internal reserves for raising labor productivity, especially in the leading brigades, and so we place great reliance on our scientists. They have designed and we have tested a good bit for the deposits of Tyumenskaya Oblast, the 215.9-millimeter MZGV bits. But we continue to receive only small numbers of these bits from series production. We have been promised a drilling machine adapted for work in the North for several years, but we still do not have enough conventional drilling machines. Some of the machines now used for drilling should be written off, and we have just one T12MZ-9 turbodrill, which is used for drilling with a jig, for every three brigades. We are also short of buses for transporting watch workers, cultural activities booths, and dining halls.

Our brigade has adopted stepped-up socialist obligations upon joining socialist competition to overfulfill the assignments of the third

year of the Tenth Five-Year Plan and celebrate the first anniversary of the new USSR Constitution in a worthy manner.

We call on all collectives of drilling brigades in the country to go on a shock labor watch in 1978 and respond to the party appeal to "work better today than yesterday, better tomorrow than today" with new labor successes.

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Grozneft' Petroleum Association Director Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 pp 12-13

[Statement by V. A. Sorokin, general director of the Grozneft' Association]

[Text] The collective of Checheno-Ingush ASSR petroleum workers fulfilled its plan and socialist obligations for all technical-economic indexes in the anniversary year of 1977. The successes achieved were the result of widespread socialist competition to celebrate the 60th anniversary of Great October in a worthy manner and of the multifaceted work of party, trade union, Komsomol, and economic organizations. The program for the third year of the Tenth Five-Year Plan is very intensive both for extraction of petroleum and gas and searching for pools of petroleum in the deep Cretaceous and Jurassic beds of the eastern Subcaucasus and the beds of the Upper and Middle Eocene and Upper Cretaceous in Georgia. Plans call for beginning deep exploratory drilling at five sites in the Checheno-Ingush ASSR and two in Georgia.

In order to fulfill the "Comprehensive program for increasing the petroleum output of layers" and to extract maximum residual reserves of petroleum from deposits in the Checheno-Ingush ASSR that have been worked since the 19th century the Grozneft' Association in 1978 must carry out an industrial experiment to pump gas into the layer at a pressure of 320 kilogram-force per square centimeter. The necessary structures for conducting the experiment have already been built.

The problem of increasing reserves, which determines the present and the future of the petroleum industry, is one that concerns all the country's petroleum regions. Therefore, it is time to bolster the material-technical and scientific base of the associations which are carrying on the search for petroleum at great depths. The Grozneft' Association is taking all necessary steps to raise the effectiveness of geological prospecting and fulfill the assignments for increasing petroleum reserves.

The association has made a forecast estimate of petroleum and gas reserves for its entire operating territory. In 1975-1977 as the result of a new approach to geological prospecting and seismic work promising sectors with previously unknown anticlinal folds in Cretaceous beds and Jurassic subsalt beds were identified. More than 12 such

structures have been established and fairly high petroleum and gas outputs have been obtained from three. In addition, there are still significant areas in the Checheno-Ingush ASSR and neighboring North Osetia where seismic investigation should be carried out immediately because preliminary data are very positive. All this allows us to be quite optimistic in estimating prospects for petroleum and gas exploration in the Checheno-Ingush ASSR. The first two years of the Tenth Five-Year Plan showed the high efficiency of geological exploration in this region.

However, seismic investigation and drilling work involve great difficulties owing to the complex topography, existence of various utility lines, industrial and other installations, and major populated points, and the lack of special geophysical equipment, drilling equipment with load capacities of 250-350 tons, and special tools.

The time has come to work out a long-range comprehensive program for opening up deep and superdeep beds that are promising for petroleum and gas not only in the Northern Caucasus but throughout the entire country, including Western Siberia. This program will be much more complex and broad in scale than the usual ones and, most importantly, it will take a long time because it will require a significant reorganization of many national economic sectors: metallurgy, machine building, instrument making and automation equipment, and many others. The time factor is paramount in deep and superdeep drilling. This can be seen from the example of the Checheno-Ingush ASSR where the average time required to open up deep pools of petroleum and gas is quite considerable owing to complex mining geological conditions, exploration techniques, and particularly the level of machinery, technology, and organization of drilling work at such depths. In addition, significant one-time capital investment will be required for this program; but it will be paid back richly.

To solve the problem of deep and superdeep drilling a testing area must be set up within the Grozneft' Association to incorporate new machinery, tools, instruments, and all possible techniques. It should be done here because we have the "treasure" of the sector, specialists in superdeep drilling and, equally important, we have reserves of hydrocarbon raw materials.

To accelerate the preparation of structures for deep and superdeep drilling the Grozneftegeofizika Trust should be supplied with a set of equipment for work by the Vibroseys [vibro seismic] method and the annual delivery of detonating fuse should be increased to 6,000 kilometers with the allocation of special caterpillar machinery to work in the complex topography of the Northern Caucasus.

The Grozneft' Association, which is carrying on superdeep drilling not only in the Checheno-Ingush ASSR but also in Georgia, must be supplied with high-quality drilling and special equipment and tools.

Solving just some of the questions and problems will make it possible to bring the lower horizons of productive beds into active use not only in the Northern Caucasus but in all regions of the country. Because a further rise in petroleum extraction appears to be tied to the lower deep and superdeep horizons we must work out and implement a comprehensive program for opening up the earth's depths as rapidly as possible.

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Mangyshlak Association Director Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 p 14

[Statement by V. I. Timonin, general director of the Mangyshlakneft' Association]

[Text] The collective of the association in 1977 fulfilled a large volume of work aimed at stabilizing petroleum extraction. The plan for drilling and putting wells into operation was overfulfilled, 374 wells were switched to mechanized petroleum extraction methods, and the program to separate sites at pressure-injection wells was fulfilled. However, the great efforts made by the collective did not have the desired results and the plan for petroleum extraction, unfortunately, was not fulfilled.

In September 1977 the scientific-technical council passed a resolution envisioning an enormous amount of work to improve the system for working the Uzen' deposit, the machinery and technology for extracting, collecting, and preparing the petroleum, and to carry out a set of scientific research and experimental projects.

Our collective is ready to apply all its efforts to performing these jobs at the established times on the condition that the association is supplied with essential material-technical resources on time.

Difficult tasks for petroleum and gas extraction and well drilling have been set for 1978. The association has worked out concrete measures and calculated its needs for material-technical resources in order to fulfill these assignments; this information has been submitted to the Ministry of Petroleum Industry. However, some important questions that directly affect the rhythmic work of the association have not been satisfactorily resolved and cause us great concern.

If we are to work rhythmically it is very important for production plans to be exactly balanced with material-technical supply plans. The volume of operational drilling for the association in 1978 is to be increased by one-third, but the question of supplying drilling rigs to the association has not yet been solved.

The association must be fully supplied with AzINmash-30 aggregates and tank trucks in order to increase utilization of our wells and carry out scheduled preventive maintenance work on time.

The volume of deep studies must be increased significantly to improve checks on the condition of work at the deposit. and this makes it important to see that the association is fully supplied with equipment for work at great depths, above all deep pressure gages.

Pumping large amounts of hot, aggressive water knocks out the fasteners on the fittings of the injection wells, but our allocated resources of these fasteners are inadequate.

The association was regularly constrained in its use of electricity during 1977 owing to the lag in construction of generating capacities in our region, and this was a direct cause of the reduction in petroleum extraction. But the expansion of energy capacities is going forward slowly. As a result, the situation with electricity supply to the deposits is becoming even worse.

In recent years a discrepancy has been permitted between purchasers and contractors in plans for capital construction and introduction of housing. As a result, the association cannot conclude contracts with contracting construction organizations at the proper time and the deadlines set for introduction of installations and capacities are violated.

Timely improvement in the state of work to build up new deposits on the Buzachi Peninsula will make it possible to bring them into operation more quickly, thus increasing the extraction of petroleum for the association. Therefore, it is essential to eliminate discrepancies in 1978 construction plans and also to review and coordinate work volume for these deposits until the end of the current five-year plan, assign contracting organizations to do this work, and establish precise, concrete assignments for them.

Each year the association experiences a greater shortage of workers and engineering-technical personnel. We must resolve a number of social questions in order to attract and keep regular workers in our region. The most important ones are increasing the volume of housing construction and improving water supply to the population.

The petroleum workers of Mangyshlak will make every effort to celebrate the first anniversary of the adoption of the new USSR Constitution in a worthy manner and complete the year of 1978 successfully.

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Chief of All-Union Refinery Association Reports

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 5, May 78 pp 14-15

[Statement by L. M. Kuznetsov, chief of the Soyuzneftegazpererabotka All-Union Production Association]

[Text] Employees of the Soyuzneftegazpererabotka Association have a clear idea of the role they are expected to play in accomplishing the

tasks set by the 25th congress with respect to the use of petroleum gas in our country, the bulk of which should be processed at plants of the enterprise. Moreover, most of the gas is extracted in Western Siberia, which is also where maximum losses occur.

The challenges facing the association in 1978 are difficult. Thus, we must improve the work of the units which fell behind in 1977 (Korobkovskiy and Kazakh) and did not supply the necessary amount of gas for gas-lift. Special organizational-technical measures have been worked out for this purpose and the collectives of the plants are working on them. However, the principal task of the association and our enterprises remains the same as in preceding years: capital construction and increasing gas refining capacities. In the first quarter of 1978 we are to launch a booster compressor station at the Nizhnevartovsk Plant and the initial complex at Balyk in order to have 7-8 aggregates to supply fuel to the Surgutskaya GRES. By the end of the year the association is expected to start up the South Balyk Plant with a gas refining capacity of 500 million cubic meters and a compressor station at the Usinskoye deposit.

Enterprises of the Soyuzneftegazpererabotka All-Union Production Association have done fairly well with introducing capacities. This is because highly skilled operations workers have generally been present when the installations were under construction.

Among the chief tasks of the association in 1978-1979 are construction of the Usinsk gas refinery, which is expected to supply fuel to the Pechorskaya GRES, acceleration of construction on the petroleum products pipeline to transport unstable gaseous gasoline from the regions of Western Siberia, construction of the Parabel' - Kuznets Basin gas pipeline, and supplying raw material to the Gnedintsevskiy gas refinery.

Understanding our full responsibility for successful accomplishment of the tasks facing the sector, we will make every effort to live up to the trust in us that has been shown.

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TSIKLON WIND-POWERER ELECTRIC PLANT

Moscow SEL'SKAYA ZHIZN' in Russian 6 Jun 78 p 4

[Article by A. Urvantsev, Moskovskaya Oblast: "Harnessed Wind"]

[Text] In the history of mankind, the force of the wind was one of the first power sources. It moved sailing ships wandering the trackless ocean, it turned windmills. Today this force is being utilized by modern technology.

We are talking to a man who has built wind engines on Cape Zhelaniye and Belyy Island. A wind engine installed at the polar station on Vaygach Island as far back as 1940 is still working today. Many a generation of polar explorers has come and gone over the decades, yet the wind turbine goes on supplying energy for the communications equipment, providing people with light and heat. Today Vladimir Iosifovich Sidorov is the director of the Tsiklon Scientific Production Association where things are going well in the development of a base for production of wind-powered installations.

It would seem that today, when fossil-fuel power plants are operating turbo-generators with power of one million kilowatts, wind turbines would be pushed aside. But it is too early to count them out; they may still be of great use to mankind.

In the years under Soviet leadership we have done extensive scientific research and developed original methods of utilizing wind power. The most promising regions for using wind power installations are the steppe belts of the RSFSR, Kazakhstan, Soviet Middle Asia, the extensive coastal regions of seas and oceans, the enormous length of the shoreline with its strong and constantly blowing winds. This cost-free and priceless gift of nature can and must be used by man. For example on the Kola Peninsula alone, wind engines, if installed there, could provide 200 million kilowatt-hours of energy.

And in agriculture, there are thousands of production sections that are not hooked up to power lines. These are nomad shepherd camps, fishing villages, backwoods mountain villages, forgotten isolated farms on the steppes. Wind engines could provide electric power to these sections. Wind units provide

water for cattle on remote pastures, transfer moisture from wells and rivers to oasis irrigation areas. The series-produced Tsiklon-6 unit raises water from a depth of 12 meters. It is equipped with a device for desalinating water. Wind units of this kind are now operating for instance in Moldavia, in the village of Gurokamenka of the Floreshtskiy Rayon, on the Pobeda collective farm in Chimishliyskiy Rayon, and on islands in the Caspian Sea.

...The wind turbine testing ground. It is located in the vicinity of the city of Istra near Moscow. Here new wind installations of various powers are being tested.

"And there's our latest model," says V. I. Sidorov, pointing to a metal grid tower. "Blade span 24 meters, power of the facility 100 kW."

Before they are put into series production, these units go through state testing on a mountain pass near Novosibirsk, where the wind speed reaches 80 m/s. At the end of the current five-year plan, so we are told by V. I. Sidorov, a wind unit with power of 5,000 kW is to be built!

The reader may well ask: "But what happens when the wind fails?" First of all, the wind-power electric plant is located where there are strong and steady winds. Secondly, it can operate in conjunction with a standby fueled unit--a thermal turbine. Scientists have worked out a system for "storing" wind energy by dissociating water into oxygen and hydrogen. In burning hydrogen, we get steam for a steam-gas turbine that will operate when the wind dies. In addition, still another problem has been solved--the wind electric plant can operate in parallel with a high-capacity power system.

An interesting calculation has been done at Tsiklon. On the Chukot Peninsula on Cape Shelagskiy the mean annual wind speed is 9 meters per second. During the year the probability of calms is eight percent. A wind-powered electric plant with thermal standby in 1 year can produce 660 million kWh. It would take 264,000 metric tons of fuel to produce such an amount of energy by steam installations!

In short, wind installations are inexpensive, and their returns are enormous. They do not need power transmission lines, and they do not pollute the atmosphere with smoke. For instance, 600,000 diesel installations used in irrigation could be replaced by only 80,000 wind units. Scientists and designers of the Tsiklon Association are now working on increasing the area of wind coverage, and on harnessing even the hurricanes to work for man... There is even the intriguing idea of suppressing sea winds. And so, the old windmill that would seem to be a thing of the past will serve men for a long time to come.

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DEPUTY MINISTER AVDEYENKO COMMENTS ON YOUTH IN INDUSTRY

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 27 May 78 p 1

[Text] P. M. Avdeyenko, deputy minister of the petroleum processing and petrochemical industry, talks about the role of youth in the establishment and development of this sector and in the solution of the most important problems, and about working with young workers and specialists on the basis of long-range comprehensive planning.

The petroleum processing and petrochemical industry is rightly considered one of the "youngest" sectors of the national economy. Its youth lies not only in the fact that most of our leading enterprises are of "Komsomol age," but also in the fact that their collectives consist mainly of young people. And even its history is tied up with one of the bright pages in the history of the Komsomol -- participation in the shock construction of large-scale chemistry facilities. Even today the Komsomol is the patron of our new building sites. Young people in the ranks of front-line workers are the leaders in competition, frequently become the initiators of good beginnings in the largest enterprises in petrochemistry and petroleum processing.

Every third worker in our sector is a person of less than 30 years of age. And this is the age of unflagging seeking and curiosity, thirst for greater things and striving to get ahead. All these qualities can be found in our front-rank workers -- Leonid Berzheminskiy, assembly worker at the Omsk Tire Plant, Vladimir Belyayev, machine operator at Kuybyshevnefteorgsintez, Vera Vashko, braiding machine operator at the Sverdlovsk Commercial Rubber Goods Plant, and many other young workers who have been awarded the Leninist Komsomol Prize for their self-sacrificing work. More than 20,000 young production workers have completed quotas for the second and third years of the five-year plan ahead of schedule.

Today every third worker in the sector is a shock worker of communist labor, more than half of the workers and young specialists take part in the All-Union Inspection of Scientific and Technical Creativity of Youth. In the current

five-year plan they have submitted more than 27,000 efficiency suggestions, saving more than 30 million rubles.

Improvement of the work and the sociopolitical activity of young laborers, elevation of their cultural-technical level and trade skills have to a great extent been achieved thanks to realization of the long-range plan of work with young workers and specialists.

The work experience of our ministry with indoctrination of young people has been mentioned by the Committee on Youth Affairs of the Supreme Soviet of the Soviet Union, and has been highly evaluated in the summary report of the Central Committee of the Leninist Young Communist League of the Soviet Union to the Eighteenth Congress of the Komsomol. In working out a unified comprehensive system for youth indoctrination, we have attempted to forecast and control the processes of socioeconomic development of youth collectives. The long-range plan has embraced all aspects of the labor and life of young people: incorporation into the production collective, improvement of professional and general educational level and social activity, participation in competition and scientific-technical creativity, improvement of conditions of work and everyday living, use of free time... A considerable part in the accomplishment of these plans is played by a council on work with youth that has been set up in affiliation with the ministry. Such councils are now being formed and put into action in all centers of petrochemistry and oil refining.

In setting up these councils, we have made it possible to influence improvement of the effectiveness of work with young men and women in all collectives of the sector, and have attracted a considerable detachment of workers and the most highly skilled specialists, an extensive active party membership in public affairs, considerable scientific forces to take part in the solution of youth problems.

Transformation of Western Siberia to the main petroleum base of the nation has placed new problems before our sector. In speaking of the industrial development of the West Siberian frontier, L. I. Brezhnev noted in his speech to the Eighteenth Congress of the Komsomol: "A huge gas and chemical industry is now bursting forth there." Among the most important chemistry facilities are the Tomsk Petrochemical Combine and the Tobol'sk Petrochemical Complex. These areas have been declared All-Union Komsomol Shock Construction Sites.

The capacities of these enterprises are great, but immeasurably greater still are the underground riches of Tyumen'. "The Tyumen' reserves are going to be with us for many years," emphasized L. I. Brezhnev in his speech to the Eighteenth Congress of the Komsomol. "And it is from Tyumen' that we are counting on getting the main increase in recovery of petroleum, gas, and the valuable chemical raw material derived from them for the next few years." Even now, oil refineries and petrochemical enterprises at the different ends of our nation are working on Tyumen' petroleum -- in Kherson and Khabarovsk, in Odessa and Omsk, in Fergan and Angarsk.

Acquisition of the natural riches of Tyumen' gives a new impetus to the development of our sector. Even now we have taken second place among the industrial ministries with respect to volume of production. Nearly a third of our goods have been granted the Emblem of Quality. And this headlong development would have been impossible without the participation of Soviet youth.

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MANPOWER

CENTRAL STATISTICAL ADMINISTRATION OFFICIAL DISCUSSES 1979 CENSUS

Kiev RABOCHAYA GAZETA in Russian 22 Jun 78 p 3

[Article by V. Fedorenko, deputy chief of the census division of the Ukrainian SSR Central Statistical Administration: "Everyone's Affair: The Coming All-Union Population Census"]

[Text] A unionwide population census will be conducted in our nation from 17 through 24 January 1979. This will be the sixth census since the beginning of the Soviet regime.

The first Soviet demographic, industrial and agricultural census of 1920 was conducted on the initiative of V. I. Lenin. Vladimir Il'ich was personally involved in its organization. He stated that the census data would be of primary and guiding value in the socialist construction of the Soviet Republic.

The fundamental changes that have taken place in the life of the Soviet people during the last 60 years will be extensively reflected in the materials of the unionwide census of 1979. We will obtain data on the distribution of the nation's population, as well as detailed descriptions of its socioeconomic and ethnic composition and educational level in combination with demographic indicators. We will learn the precise distribution of the population among republics, krays, oblasts, districts, rayons, cities, urban settlements, rural soviets and rural populated points. An important role will be played by detailed information on the composition of the population in terms of sex, age, marital status, nationality, language, training and educational level, the distribution of the population in terms of sources of income, fields of employment, branches of the national economy, types of production and types of institutions, and public and other socioeconomic groups in combination with the demographic characteristics of these groups.

The information obtained on the number and makeup of family members engaged in housework and private subsidiary farming will determine how many of them could take part in national production and the conditions under which this could occur. Data on the length of time people have lived in populated

points and data on day-to-day demographic statistics will permit more profound study of the processes of migration and the adaptation of the population in a particular territory.

The census will be of great political value. Its materials will reflect the great transforming power of the socialist order and will demonstrate once more the tremendous successes our people have achieved during the 61 years of Soviet rule in implementing V. I. Lenin's brilliant ideas.

The year, month and date of the census were chosen with good reason. In the first place, conducting the census in 1979 will ensure the attainment of data on the population for the compilation of the plan for national economic development for the 11th Five-Year Plan and the more distant future. In the second place, this is in line with the recommendations of the UN Statistical Commission concerning the conduct of censuses in years ending with zero or close to these years. In January, there is little migration, and this simplifies the acquisition of precise data. This is also the reason for the date chosen--17 January: Not many people go out of town in the middle of the month and the middle of the week. Besides this, vacation will be over for general educational schools and vocational and technical schools by this time and will not have begun as yet for VUZ's.

The population will be recorded everywhere at midnight, local time, between 16 and 17 January.

Despite the fact that the census is to be conducted over a period of 8 days, the data in census form will be entered only in accordance with the actual state of affairs at midnight on the night of 16/17 January, regardless of the time when the census-taker visits the citizen's home and fills out the census form. In other words, each citizen of the Soviet Union will be recorded in the city or village where he was on the night of 16/17 January.

The mechanics of the census are simple--an interview of the population in the home by specially trained census-takers. No documents will be required from the citizen when the census form is being filled out. The census-takers are strictly forbidden to give information to anyone about replies to the questions in the census form.

The census is to be conducted on the basis of two programs: total and sample studies. The first of these includes 11 questions for all citizens, while the second has 5 more questions to be answered by one-fourth of the nation's inhabitants. The comprehensive census program contains questions about the population category, relationship to the head of the family, sex, age, marital status, nationality, native language and other Soviet languages, educational level, type of academic institution and source of income. The sample census program includes questions about the place of work, the job, the public group, the length of time the person has lived in one place and, for women, the number of children they have borne.

These questions are to be answered by a sample group rather than by the entire population because this will produce a significant savings in monetary and labor expenditures involved in conducting the census and processing census materials. The quality of the results will not suffer, since the sample group is large (25 percent) and its data can be completely applied to the total population. All of this will be accompanied by a survey of persons of working age engaged in housework and private subsidiary farming.

Preparatory work for the coming census will be performed for more than 2 years in our republic. In accordance with the deadlines set by the government, the boundaries of all urban settlements have been delineated and their street names and addresses have been put in order. Maps of cities, urban settlements, large villages and rural regions have been drawn up and the accuracy of records kept on the urban and rural population has been verified. Lists have been compiled of residential buildings in cities, urban settlements and large villages, as well as rosters of rural populated points. On the basis of these documents, census regionalization is already being conducted--that is, the territory of all urban and rural populated points is being broken up into census divisions, instruction centers and computer stations.

Mass-explanatory work will play an important role among preparatory measures for the coming census. It will be performed by agitators, lecturers from the Znaniye Society, members of commissions assisting the census and the workers of state statistical agencies and cultural and educational institutions, who will present lectures and reports to the workers, print articles and reminders in the periodical press, speak on radio and television and set up visual reminders (stands and displays) on the main streets, in parks, movie theaters, cultural centers and clubs and at enterprises and institutions. More than 2,000 census stands and information booths have already been set up in the republic's cities and rayons, around 50,000 lectures and talks have been presented to the population and more than 5,000 announcements have been made in the press and on the radio.

The unionwide population census is an undertaking of great state and political significance. V. I. Lenin said that censuses were not a departmental affair or a republic affair, but the affair of all Soviet institutions. These words still apply even today, now that preparations are being made for the unionwide census of 1979.

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SHCHEKINO METHOD DISCUSSED

Moscow MUKOMOL'NO-ELEVATORNAYA I KOMBIKORMOVAYA PROMYSHLENNOST' in Russian No 4, 1978 pp 11-12

[Article by M. Shelud'ko, department head at the Economic Planning Administration of the USSR Ministry of Procurement: "The Shchekino Method in Action"]

[Text] The method of the Shchekino chemical workers has proved highly effective and is being used at more and more enterprises of the procurement system. After it was used at the Kishinev Bakery Goods Combine, it was instituted at several enterprises of the procurement ministries of the Russian Federation, the Ukrainian SSR, the Belorussian SSR, the Kazakh SSR, the Lithuanian SSR, the Moldavian SSR, the Latvian SSR and the Kirgiz SSR. By the end of the Ninth Five Year Plan, 43 enterprises were already working according to this method. The collectives at these enterprises took on additional commitments to increase production volume and elevate labor productivity and average wage levels. These significantly exceeded ratified five-year-plan indicators.

For the fulfillment of these higher commitments, the enterprises worked out a group of organizational and technical measures aimed at the improvement of equipment and technology, the organization of labor and production control and envisaging the widespread combination of professions, the expansion of service zones and the improvement of personnel qualifications.

Carrying out these measures made 2,300 persons available for staffing approximately five bakery goods combines with a daily processing capacity of 500 tons of grain. All of this was reinforced by incentive measures, not only by means of one-time bonuses but also through the establishment of raises of up to 30 percent of the wages and salaries of enterprise workers. As a result, the additional commitments which were taken on were almost completely fulfilled and assignments envisaged in the five-year plan for an increase in production volume and a rise in labor productivity were considerably overfulfilled.

Considering the great impact of the introduction of the Shchekino method, the USSR Ministry of Procurement decided to conduct extensive explanatory work at enterprises to discuss their transition to this method of operations and recommended that measures concerning the introduction of new equipment, the mechanization of labor-intensive processes and the improvement of the organization of labor be envisaged in production plans. Seminars were conducted at the Kishinev and Baranovich bakery goods combines for the thorough study of the experience of enterprises working according to the Shchekino method in 1977, and the managers of enterprises which were making the transfer to the Shchekino method of operations were given an opportunity to acquaint themselves, in the direct production situation, with the experience in the introduction of the comprehensive method for improving the organization of labor, material incentives and planning, and learn about specific organizational and technical measures to guarantee a high economic effect from the introduction of the Shchekino method.

Supplementary Commitments of Enterprises Transferring to
Shchekino Method of Operations (1975 in % of 1970)

Indicators	Ratified Five-Year Plan	Commitments Taken On
Gross product	126.6	131.6
Labor productivity	118.8	142.0
Average wage	106.4	120.2

The Shchekino method, which was developed 10 years ago and was successfully tested in practice by enterprises during the Ninth Five-Year Plan, has become more widespread and more developed. During the first half of 1977, another 45 enterprises transferred to this method of operations, and another group of enterprises began mastering this method in the beginning of 1978. The study and generalization of the operational experiences of enterprises working according to this method will be continued in the future by means of seminars, conferences and other measures to ensure that it will be introduced on a broader scale and to guarantee the continuous application of this method.

Operational Results of Enterprises Working According to
Shchekino Method in Ninth Five-Year Plan
(1975 in % of 1970)

Indicators	Commitments Taken On	Report	Average for USSR Ministry of Procurement as a Whole
Gross product	131.6	131.3	131.6
Labor productivity	142.0	141.1	123.8
Average wage	120.2	120.9	115.1

The transfer to operations according to the method of the Shchekino chemical workers in the Tenth Five-Year Plan is being accomplished in accordance with the Conditions for the Further Introduction of the Comprehensive Method for Improving the Organization of Labor, Material Incentives and Planning in Accordance with the Experience of the Shchekino Chemical Combine, ratified in January 1977 by the State Committee of the USSR Council of Ministers for Labor and Social Problems, USSR Gosplan, the USSR Ministry of Finance and the AUCCTU, containing new premises absent from conditions previously in effect. These premises are the following.

At present, enterprises are transferred to the Shchekino method of operations by the union republic ministries of procurement with the approval of republic trade-union committees after the proper proposal and estimates have been submitted by the enterprises themselves and oblast production administrations.

Additional reserves for a rise in labor productivity and a reduction in the size of the personnel staff are included as part of annual and 5-year counterplans which are examined in the established order and are intensified by means of higher normatives in accordance with the existing procedures for drawing them up.

The part of the wage fund that is saved due to the freeing of part of the personnel staff can be completely utilized during the year for the establishment of additions of up to 30 percent to wages and salaries and for the payment of one-time bonuses. If part of the savings in total wages due to the freeing of personnel is unused during the year for some reason, 50 percent is redistributed among enterprises working according to the Shchekino method and deposited in material incentive funds as above-plan enterprise profits. All-union and republic associations can, by the decision of the boards of directors of enterprises using the Shchekino method of operations, centralize no more than 20 percent of the savings in wages deposited into material incentive funds and then redistribute this amount among enterprises on the basis of their current level of labor norming.

The combination of professions (jobs), the expansion of service zones and the augmentation of the volume of work performed are only permitted in those cases when the worker is able to fulfill his obligations well and on time within the established length of the working day, both in his basic and his auxiliary jobs, and can increase his operational volume.

The size of additional payments for the combination of professions (or jobs), the expansion of service zones and the augmentation of operational volumes, in amounts up to 30 percent of the wage (or salary) of the basic job, depends on the complexity, nature and volume of additional work, the quality of normatives employed and the degree to which working time is utilized. At the same time that these additional payments are set for workers, engineers and technical personnel and employees, job descriptions with a certain number of additional functions must be envisaged.

Additional payments for the combination of professions (or jobs), the expansion of service zones and the augmentation of operational volumes are only paid to a newly hired worker if he takes on all of the functions of the worker who received such additional payments previously. The additional payments are prorated for personnel who work only part of the month.

The size of one-time bonuses for the development and implementation of organizational and technical measures which guarantee a reduction in the size of the personnel staff and a rise in labor productivity in comparison to planned figures depends on the current level of labor productivity and the actual savings in wages due to the introduction of these measures.

The earlier premise, according to which the establishment of additions to salaries and the payment of one-time bonuses to administrators, engineering and technical personnel and workers on the managerial staff of the enterprise depended on the fulfillment of the sales and profit plan by the enterprise as a whole, as well as on rates of rise in labor productivity which exceeded the rate of rise in average wages, while the administrators, engineering and technical personnel and employees of production units, shops and sections were only paid bonuses on the condition of fulfillment of the plan for production volume and the reduction of production costs, is no longer in force.

In order to stimulate the transfer of enterprises to the Shchekino method of operation, the USSR Ministry of Procurement has charged the union republic ministries of procurement and administrators of enterprises of union jurisdiction with guaranteeing enterprises operating according to this method preferential terms for Gosbank credit for carrying out measures to mechanize and automate production, and with distributing part of the production development fund to the enterprises for this purpose.

Therefore, even more extensive prerequisites have been established during the Tenth Five-Year Plan for the introduction of the Shchekino method for raising labor productivity through improvement in the organization of labor, material incentives and planning. The further dissemination of the experience of the Shchekino chemical workers at enterprises of the procurement system will serve as an effective weapon in the struggle to fulfill the decisions of the 25th CPSU Congress on turning the Tenth Five-Year Plan into a five-year plan of efficiency and quality.

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TIMBER RESOURCES

TIMBER INDUSTRY PLANS IMPROVED ORGANIZATION, TECHNOLOGY, SITING

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 2, 1978 signed to press 8 Feb 78 pp 33-48

[Article by V. V. Glotov, doctor of economic sciences, Institute of Economics of the Academy of Sciences USSR in Moscow, I. N. Voyevoda, candidate of economic sciences, Institute of Economics and the Organization of Industrial Production of The Siberian Department of the Academy of Sciences USSR in Novosibirsk, and F. N. Morozov, candidate of economic sciences, VNIPIEIllesprom in Moscow: "Regeneration of the Country's Wood Resource"]

[Text] For many years the development of the timber and wood processing industry concentrated on improving the structure of production. The 25th CPSU Congress posed new, more complex tasks for the sector. Meeting this challenge requires analysis of a broad range of factors in raising efficiency and putting them to work, particularly long-term factors. Among the latter we can certainly include: (a) stepping up the tempo of development of production and improving its proportions; (b) comprehensive use of forest resources; (c) raising the quality of products; (d) improving the territorial placement of production and interregional links; (e) substantiating efficient forms of production organization; (f) introducing achievements of scientific-technical progress.

Let us consider these factors in greater detail.

Tempo and Structure

The USSR is significantly ahead of the United States in rate of growth of production of manmade board, pulp, paper, and cardboard. Nonetheless, the absolute growth of production of these products in the United States is still higher. U.S. industry produces from 1,000 cubic meters of wood a set of products worth 2.7-3.0 times more than would be produced from the same wood in the USSR. To eliminate this gap in the coming 15 years it would be necessary to envision a growth rate of at least seven percent a year for gross forest product.

The United States has attained a high level of development in plywood production (17.5 million cubic meters in 1975 compared to 2.2 million in the USSR). The production and use of plywood provides highly efficient use of raw materials as well as, most importantly, acting as a major factor in saving labor in construction, machine building, and other sectors. It would appear that the time has come to build very large new enterprises, primarily in Eastern Siberia, to produce plywood from both hardwood and coniferous raw material.

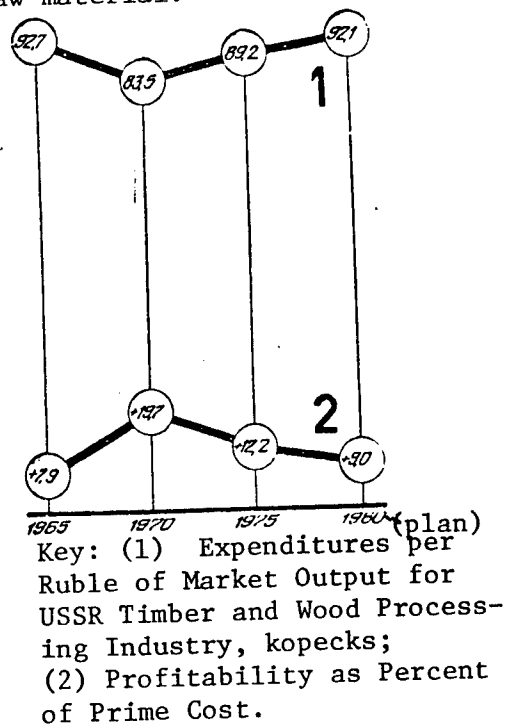
A significant share of our timber is used without processing. More than 30 million cubic meters is used to make mine supports, poles for power transmission lines, and railroad ties and 70-75 million cubic meters of firewood is used for fuel. The use of wood in the mines can be cut by at least 6 million cubic meters in the near future by the introduction of metal supports. Opportunities to conserve wood in the coal and mining industries are also substantial and will be even more when rubber timbering is mastered.

All essential conditions exist for a sharp reduction in the use of wood for fuel, which will permit a savings of about 30 million cubic meters of wood a year, approximately 1.8 billion rubles of capital investment, and 300-360 million rubles of ongoing expenditures. Processing wood that now is burned will increase the annual volume of this scarce output by 2.3-2.4 billion rubles.

In recent years the export of all type of forest products has consistently risen. In just the last 10 years export, converted to logs, has more than doubled. All the same, our export could be much greater in volume and more rational in structure. In total volume of wood export Canada surpasses the USSR by more than 3-fold, the United States is 2-fold greater, Sweden--1.7-fold, and Finland--1.7-fold. Japan buys wood raw materials in the USSR, Canada, and Brazil. but it exports more plywood than the USSR.

Comprehensive Use

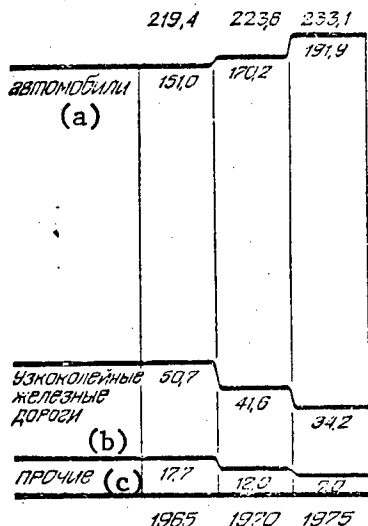
The principal way to improve the use of low-grade wood and by-products is increasing the production of industrial chips for the pulp and paper industry, chip and fiber board, and hydrolysis-yeast products. The use of by-products and firewood-grade wood for industrial needs increased 4-fold from 8.6 million cubic meters to 34-35 million,



in the period 1965-1975. Most of this increase went into pulp and paper production (approximately 17 million cubic meters), while somewhat less went to produce artificial board (6 million) and other products. The volume of economically feasible resources is much more, however: 40-42 million cubic meters in sawmilling and wood processing and 7-8 million in logging.

The use of by-products of sawmilling to make industrial chips can be expanded by increasing the barking of the wood. Barking sawlogs not only promotes production of high-quality chips but also improves the efficiency of sawmilling. Despite this, even at enterprises of the USSR Ministry of Timber and Wood Processing Industry, less than 40 percent of the total volume of wood being sawed was debarked.

Timber Hauling by Types of Transportation, USSR Ministry of Timber and Wood Processing Industry, millions of cubic meters



Key: (a) Motor Vehicles;
(b) Narrow-Gauge Railway;
(c) Other.

The use of birch, ash, poplar, and similar species and broader economic use of deciduous plantations and timber reserves in protective wooded areas (group I) continue to be pressing problems. The scissors trend in use of our forests has not been eliminated yet; we are overcutting conifers and not cutting enough hardwoods. The violation of the forest use standard (calculated cut) by species reaches 50 million cubic meters a year.

The use of deciduous trees has become both a forest industry problem and a major ecological problem. The fate of the woods in the European USSR depends significantly on the proportionality of logging by species. The total reserve of soft-leaves in the European USSR, including the Urals, is 7.7 billion cubic

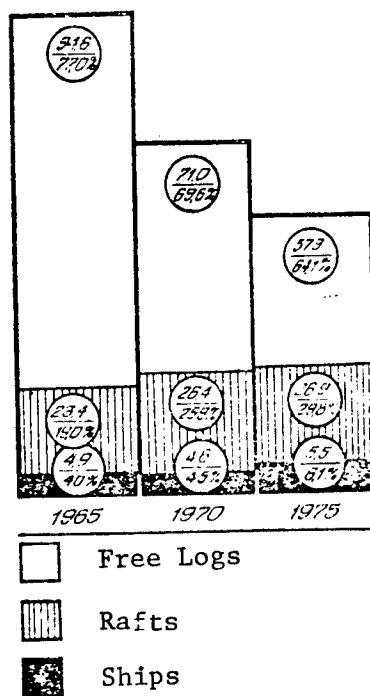
meters; 3.7 billion cubic meters of this is mature and overseasoned wood. Logging difficulties are not the explanation. The largest reserves of soft-leaved wood are concentrated in easily accessible regions of intensive forest exploitation. The problem lies elsewhere, in the organization of industrial use of wood that has a low marketability structure. More than 40 percent of the soft-leaved wood goes for firewood, and an equal amount of the remainder is classed as small lumber.

The principal way to bring deciduous wood into industrial production is by chemical processing. Many pulp and paper enterprises have confirmed the possibility of using such wood to obtain neutral sulfite cellulose

(the Kotlas, Balakhna, and Perm' pulp and paper combines) and bisulfite cellulose (the Krasnoyarsk Combine). Expenditures to reequip storage facilities and build up barking units are paid back quite quickly. In 1975 the share of soft-leaved wood in the raw material balance of pulp and paper production was not more than 10 percent. As foreign experience shows, and calculations by the Moscow branch of the State Institute for Planning Enterprises of the Pulp, Paper, and Hydrolysis Industry agree, this figure can be raised to 20-25 percent.

Soft-leaved wood is not used enough in construction and wood processing. In standard homebuilding, for example, it can be as much as 50 percent of the total wood used, but in fact the figure is much lower. In the production of packing materials it accounts for one-third of the wood, but it could be up to 75 percent.

Changes in the planning of wood use could help solve the problem. When determining the need for wood, one must know the maximum possible consumption of deciduous wood by area: repair and operations needs; construction; production and use of packing materials; machine building; furniture making, and so on. To achieve this the norms for wood use must differentiate satisfaction of lumber and sawn wood needs by tree species and allocate resources in this light. A corresponding price system is necessary to give enterprises an economic interest in using deciduous wood.



Structure of Floatage, USSR Ministry of Timber and Wood Processing, millions of cubic meters

Whereas the use of deciduous wood is the main problem in the European USSR and Western Siberia, in Eastern Siberia and the Far East it is the use of larch wood. The calculated larch cutting area today is 74 million cubic meters, but only 22-23 million is being logged. However, the demand for larch on the domestic and foreign markets is quite high, far beyond the scale of present logging. Larch has definite advantages over other species; as an example, larch poles and ties last twice as long as pine. But, to take Krasnoyarskiy Kray as an example, only 18 percent of the poles are made of larch and not more than 20 percent of the wood used in shipbuilding is larch. The use of larch bark (which is 15-17 percent of the volume of larch wood) to extract tannic acid is very important.

Extensive use of larch requires a new approach to the technology of cutting, barking, drying, processing for cellulose, and so on. In regions such as along the Angara River where the volume of a single larch tree is very great, new means of mechanization and equipment for felling and hauling timber are needed. Biological drying in the woods, spot barking, and long log floatage should be expanded.

Product Quality

Raising the quality of lumber is having a substantial economic impact. Expanded production of lumber with sawn edges leads to growth in the output of industrial chips, increases profit 2 rubles per cubic meter, and reduces transportation costs by 60 kopecks per cubic meter. Despite this, the proportion of edged lumber in all sawn lumber today is not more than 40 percent. At enterprises where it is possible to make industrial chips, this figure must be raised to 100 percent. Increasing the production of dried lumber for both the domestic and foreign markets is equally efficient.

Special antiseptic treatment promotes economical use of wood and longer service life, just as drying does. Treatment of poles, ties, and the like prolongs their service life 2.5 times. But one-third of the ties in use today have not been treated. Virtually none of the poles or lumber used in construction, even hydroengineering construction, have been treated. We can refer to useful foreign experience here. In the United States the treatment of wood has become an independent sector which employs about five percent of all workers in sawmilling and wood processing.

When setting up long-term economic links, a significant effect should be expected from the production of semifinished parts made to the customer's order. This raised profit 2.0 rubles per cubic meter in sawmill production alone and increases the concentration of by-products available for reprocessing. The additional savings on transportation is 0.5-0.7 rubles per cubic meter.

The growth in production and consumption of artificial board and plywood is intimately tied to improvement in their quality and broadening the assortment. The assortment of sheet materials today is very limited, especially for construction. The production of large-size plywood with water-resistant glues and plywoods with special coatings (paper, enamel) will have to be increased and the assortment expanded by producing plywoods of different thicknesses.

Locating Production and Interregional Ties

Our research shows that transportation costs and wages are the chief elements when evaluating the efficiency of location by the criterion of minimum calculated expenditures at logging sites. Expenditures for raw material, construction, and transportation are important for sawmilling. The key factors in plywood production are expenditures for

construction and, to a lesser extent, payment for wages and raw material. Expenditures for transportation are crucial in chipboard production. In pulp and paper production and hydrolysis expenditures for fuel, electrical energy, construction, and wages are considerable. Regions have different efficiency figures for the production of particular types of output depending on the combination of various factors, and this makes it necessary to determine the most advisable form of specialization for them.

Analysis of calculated expenditures indicates, for example, that it is most efficient to locate the production of cellulose, feeding yeasts, sawn lumber, and plywood in Eastern Siberia and artificial board and commercial lumber in the Urals and Kirovskaya and Vologodskaya oblasts. It would be advisable to increase the production of artificial board in the low-grade raw material in the relatively unwooded regions of the European USSR.

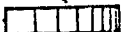
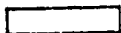
In the period 1960-1975 there was improvement in the structure of the forest products industry alongside an increase in the efficiency of its siting. The share of heavily forested regions reached 74 percent for logging operations, 45 percent for plywood production, 26.5 percent for chipboard, 69 percent for fiberboard, 70 percent for cellulose and pulp, 74 percent for standard buildings and sets of construction elements, and 53 percent for lumber. The role of Eastern Siberia has especially grown. In 1975 it accounted for 17.5 percent of the national volume of wood logged, 15 percent of the lumber production, 55 percent of the railroad ties, 11 percent of the fiberboard, 16.5 percent of the standard buildings, and 17.4 percent of the cellulose.

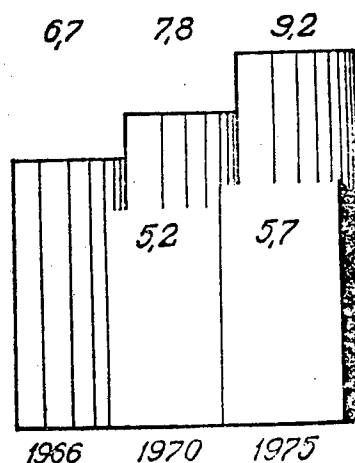
Despite these positive changes, it must be admitted that the long established and now irrational ratios between volumes of timber removed and the production of lumber by regions are changing slowly. Between 1960 and 1975 the production of lumber per 1,000 cubic meters of wood removed increased 13 cubic meters (from 198 to 211) in the heavily forested regions and 67 cubic meters (from 473 to 540) in the relatively unwooded regions. The relative increase in lumber production in the European USSR and Urals occurred simultaneously with a relative decrease in Western Siberia, the Far East, and Eastern Siberia. This unquestionably lowers the efficiency of sawmilling.

The time has come to move sawmilling capacities to the heavily forested regions. In connection with this the traffic capacities of the railroads and high efficiency in concentrating sawmilling by-products at large enterprises become crucially important.

Our country's furniture industry is developing quite fast: production rose 380 percent between 1960 and 1975. The densely populated regions of the country generally show a faster rate of growth in furniture production. But figured per capita in 1975, furniture output in Central Asia was just 37 percent of the USSR average, while in the Transcaucasus and Kazakhstan it was 59 percent, and in Eastern Siberia 77 percent. Disproportions in the siting of furniture production by assortment persist.

Pulp and paper production consumes large quantities of materials, fuel, energy, and water. At the same time its labor expenditures are not too large. Taking these factors together it may be considered highly efficient to locate large pulp-paper enterprises in Siberia, which is rich in relatively cheap energy and water resources. The time has come to begin preparations for the construction of large pulp and paper enterprises in Siberia. There are also reserves for improving siting in the relationship among subsectors of the forest industry complex. For example, stopping the complete specialization of Krasnoyarskiy Kray in logging and sawmilling would make it possible to save 70-80 million rubles a year.

 Per Felling Machine
 Per Tractor

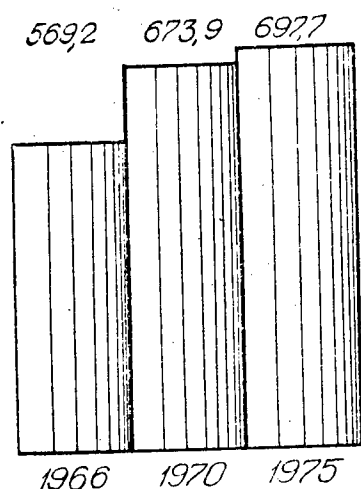


Output of Chief Machines at Enterprises of the USSR Ministry of Timber and Wood Processing, in thousands of cubic meters a year.

Forms of Production Organization

The efficiency of the timber and wood processing industry depends greatly on its forms of organization: the level of concentration and specialization; optimization of the structure of the forest industry complexes; selection of the site of wood processing.

Many production facilities are extremely scattered by departmental affiliation. In 1975 enterprises of the USSR Ministry of Timber and Wood Processing employed 44 percent of the persons working in logging, 56 percent in sawmilling, 72 percent in furniture production, 83 percent in standard buildings production, 96 percent in plywood production, 20 percent in production of building elements, and 14 percent of the persons working in other forms of wood processing. Many proposals have been made to concentrate production in a single department and no one questions their logic. But the question cannot be resolved by simply issuing a document transferring enterprises from one department to another. The situation requires deeper answers.



Forest Regeneration,
thousands of hectares

The technical-economic indexes of processors who do their own logging are usually not as good as the indexes within the USSR Ministry of Timber and Wood Processing. The USSR

Gosbank audited a group of enterprises who logged independently in 1971 and found that wage payments per cubic meter of wood procured were twice as high as at forest enterprises of the Ministry; the figures for comprehensive output were 200-300 cubic meters for the independents and 558 for Ministry enterprises in 1974. The output of wood per unit of machinery was three times as high at Ministry organizations.

The level of concentration of logging production should not be raised by a simple formalistic associating of a group of enterprises. It should be done on the basis of introducing the results of technical progress and increasing the timber traffic of the cutting yards (points where logs are cross-cut) and logging roads. In the period 1960-1975 the timber traffic of one yard in the Ministry system increased from 47,000 to 80,000 cubic meters. About half of all logging enterprises have yards which turn over less than 50,000 cubic meters and two-thirds of them handle less than 100,000. But the introduction of automated equipment becomes efficient when timber traffic is above 150,000 cubic meters. Therefore, concentrating cutting yard work is the most urgent problem.

There are approximately 34,000 subdivisions in sawmilling production. Many small units, above all those without readily available raw material, can be eliminated without new construction because the intensification of production at large enterprises permits a 10-12 million cubic meter increase in the production of lumber, more than 6 million of it in Siberia and the Far East.

The efficiency of the sector is also rising as the result of forming forest industry complexes in regions developed earlier and in newly developed regions. The term "forest industry complex" means a single, economically substantiated system of enterprises organized for comprehensive development, use, and regeneration of forest resources on the basis of combined production, specialization and cooperation with optimal structure, proportionality, volumes, and location of production.*

We believe that the composition of forest industry complexes must be broadened in most regions of the European USSR, the Urals, and the southern part of Siberia. This is called for by the scarcity of forest resources, the relatively good supply of labor, and the actual presence of many production facilities. Narrowly specialized forest industry complexes are advisable in the heavily forested and underdeveloped regions of Siberia and the Far East. A combination of comprehensive use of raw material and growth in labor productivity is achieved there by creating a fairly broad range of production facilities in an economic region (for example Krasnoyarskiy Kray or Irkutskaya Oblast) with the enterprises sited in a way that does not conflict with the idea of narrow specialization. In this case we can expect labor productivity to rise 1-1.5-fold

* Lobovikov, T. S., "Economic Aspects of the Organization and Development of Forest Industry Complexes," "Aktual'nye Problemy Funktsionirovaniya Lesopromyshlennykh Kompleksov" [Pressing Problems of the Operations of Forest Industry Complexes], Moscow, 1975, pp 24-39.

(compared to multiple-product production), a reduction in expenditures on the domestic infrastructure, and an improvement in the organization of production and its management.

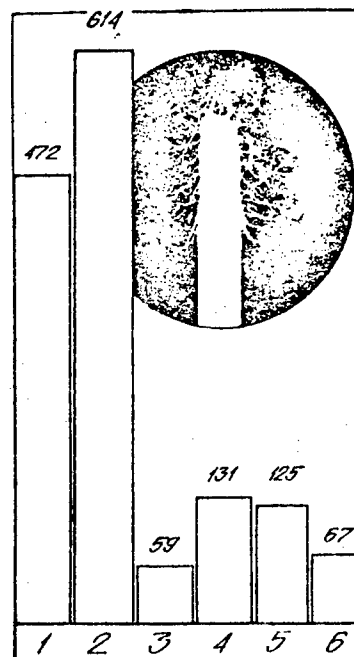
The "North-South" Problem

It is extremely important to consider regional conditions when selecting forms of production organization. This is especially important for the regions of Siberia. Moving processing enterprises close to sources of raw material leads to the creation of large new installations in remote regions with increased capital and ongoing expenditures. It would not be wise to undertake this without careful economic evaluation of such measures.

Concrete calculations made by us for the conditions of Western Siberia permit the following conclusions.

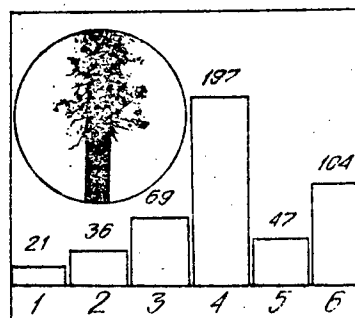
When selecting construction sites for enterprises, calculations must not be limited to just one or a few indexes, for example, transportation expenditures. In the total of all costs to produce the finished products of the wood processing industry these expenditures are not more than 3-6 percent and do not make differences greater than tenths of a percentage point in alternatives relative to the final sum of expenditures. The full range of regional differences must be considered, especially between populated regions with surplus labor and the unsettled regions of the Far North.

The principle of preferential construction of forest industry complexes near the logging areas does not apply to regions like the Far North. It is often unwise to set up intensive wood processing involving large, labor-intensive production facilities, in regions that do not have labor resources or good



1976 USSR Export, in millions of rubles

Key: (1) Round Timber;
(2) Lumber;
(3) Plywood;
(4) Pulp;
(5) Paper;
(6) Cardboard.



1976 USSR Import, in millions of rubles

Key: (1) Round Timber;
(2) Lumber;
(3) Plywood;
(4) Pulp;
(5) Cardboard;
(6) Paper and Cardboard Production Articles.

conditions for construction. It may prove advantageous to process wood taken from such regions in nearby wood consumption regions which have labor resources and more favorable conditions for construction and rapidly incorporating capital investments. Moreover, many north-south railroad lines such as Asino--Belyy Yar and Achinsk---Abalakovo have considerable reserves for increasing traffic.

Introducing the Achievements of Scientific-Technical Progress

The forest complex is classed as one of the labor-intensive sectors of the national economy. More than nine percent of the country's industrial production personnel are employed at its enterprises.

The reserves for raising labor productivity through new machinery in the sector are so great that extended research is not needed to identify them. At logging sites within the system of the USSR Ministry of Timber and Wood Processing the level of labor mechanization is 38-39 percent. From 36 to 55 percent of all workers are employed in yard and loading jobs, but the level of mechanization is not more than 35 percent. These indexes are even lower at enterprises of other departments.

Labor productivity at logging sites rose 13.7 percent in the Ninth Five-Year Plan, but the actual rise through introduction of new equipment was barely one-third of what had been expected. The growth rate of labor productivity in USSR logging is half or less that of the United States, Canada, Sweden, and Finland. In 1971-1975 the prime cost of output rose 22 percent in logging, eight percent in sawmilling, 10 percent in plywood production, 12.4 percent in the production of fiberboard, and so on. This is partially explained by the increase in wages and rise in the norms for depreciation deductions. But the impact of scientific-technical progress and improving production technology and organization plainly proved inadequate to prevent the general rise in cost.

Ultramodern machines and equipment have been built and tested for some types of work. Many of them match the best foreign models for performance characteristics. In 1975 series production of a felling-stacking machine that is the equal of similar foreign machines was begun in the USSR. The VTM-4 felling-skidding machine, which raises labor productivity fourfold in logging, has received official approval. High-powered barking units for sawmilling have appeared, for example the OK-63 and OK-100. However, forest industry enterprises are receiving new equipment slowly.

We see the solution to this problem above all in a redistribution of capital investment toward forest machine building. Another line of action is to increase the efficiency of planning and design work. The USSR sawmilling industry still does not have, for example, domestically produced equipment for deck sawing, grading, and sizing lumber. In degree of automation and productivity our equipment for processing lumber (PSP-36, PORM-10, TsSD-18, and BTSM-6) is only half to one-fifth of the level of foreign equipment.

The Distribution of USSR Export by Countries, 1976

Всего	(Total)	17 892
Япония	(Japan)	7 973
Финляндия	(Finland)	3 990
Венгрия	(Hungary)	1 465
ГДР	(GDR)	848
Италия	(Italy)	514
Прочие	(Others)	3 104

Round Timber, thousands of dense cubic meters

Всего	(Total)	8 369
Великобритания	(Great Britain)	1 597
ГДР	(GDR)	1 249
Венгрия	(Hungary)	761
ФРГ	(FRG)	598
Франция	(Finland)	658
Италия	(Italy)	546
Куба	(Cuba)	366
Прочие	(Others)	2 678

Conifer Lumber, thousands of dense cubic meters

Всего	(Total)	590
ГДР	(GDR)	142
Венгрия	(Hungary)	97
Польша	(Poland)	76
Болгария	(Bulgaria)	59
Куба	(Cuba)	46
Индия	(India)	41
ЧССР	(Czechoslovakia)	35
Прочие	(Others)	94

Paper, thousands of tons

The forest complex has a useful example of the organization of science-production associations (Siberian Scientific Research Institute of the Forest Industry -- Krasnoyarsklesprom and others). This experience should be expanded and closer economic contacts established between science-production subdivisions and machine building enterprises.

The Distribution of USSR Import by Countries, 1976

Всего	(Total)	170
Берег Слоновой Кости	(Ivory Coast)	51
Камерун	(Cameroon)	39
Конго	(Congo)	20
Гана	(Ghana)	8
Прочие	(Others)	52

Blocks of Valuable Species, thousands of dense cubic meters

Всего	(Total)	192
Финляндия	(Finland)	120
Швеция	(Sweden)	51
США	(United States)	18
Прочие	(Others)	8

Pulp, thousands of tons

Всего	(Total)	420
Финляндия	(Finland)	244
ГДР	(GDR)	42
Норвегия	(Norway)	31
Швеция	(Sweden)	28
Прочие	(Others)	75

Paper, thousands of tons

Along with the introduction of new equipment, technological processes must be improved. The delivery of round timber to large comprehensive processing centers in the form of long logs is a very promising and efficient technology for logging. The Serov Sawmilling and Wood Processing Combine has demonstrated the efficiency of this method through long years of experience. It makes it unnecessary to build cutting yards and improves the comprehensive use of raw materials.

Organizing logging operations to deliver wood to the customer in long logs is especially promising in the BAM [Baikal-Amur Mainline] region, for example. The forest industry enterprises continue to handle the jobs of logging, hauling out to trunk transportation, and shipment along trunk transportation lines to group processing points. Evaluation of the efficiency of siting the wood processing industry changes as a result of this. The processing of long logs should be organized in the zones where the largest consumers of wood are. In addition to the traditional, already established zones, given such technology we may tentatively point to Central Asia as another promising region.* In 1973 shipping of long

* LESNAYA PROMYSHLENNOST' 1975, No 1, p 8.

logs amounted to 1.9 million cubic meters, in 1974 it was 2.6, and in 1975, 4 million cubic meters. According to the findings of the Siberian Scientific Research Institute of the Forest Industry, long log shipping saves 1.5 rubles per cubic meter. The production of special railroad flatcars must be increased to develop this type of shipping. Floating timber in long logs also deserves attention.

Carrying out the regeneration of our country's forest crop requires development and implementation of a major, comprehensive, long-term special program. The fulfillment of such a program involves participation by a large number of ministries, departments, and enterprises, with the paramount roles falling to the USSR Ministry of Timber and Wood Processing, the USSR Ministry of Pulp and Paper Industry, and the USSR Main Administration of Forestry and Forest Conservation. The main thing is to step up the rate of development of production and improve its structure by preferential development of the pulp and paper, forest chemical, plywood, artificial board, and wood processing sectors. And more active use of the achievements of scientific-technical progress is crucial.

The consumers of forest output also face important challenges. It is important not only to strive to reduce the specific norms of expenditures of wood per unit of output, but also to replace wood with cheaper materials. We must intensify research on the efficiency of intrasectorial and intersectorial mutual replaceability. We still lack rigorously substantiated criteria of the national economic efficiency of replacement, for example, of lumber with artificial board and cardboard, of artificial board with plywood, and so on. We also lack reliable standards for mutual replaceability of wood, plastics, metals, and reinforced concrete.

Refinement of the structure of forest industry production, improving the use of wood raw material in the consumption sphere, and developing the forms of production organization and siting offer an opportunity to raise the efficiency of the forest complex sharply. This is a complex task. Nonetheless, it may be pointed out that according to one of the variations we calculated out, realization of the measures listed above makes it possible to increase labor productivity in the forest complex 1.8-2.0-fold and to raise the production of output (without the cost of the output of timber procurement) by about 1.6-1.7-fold figured per 1,000 cubic meters of procured timber.

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